

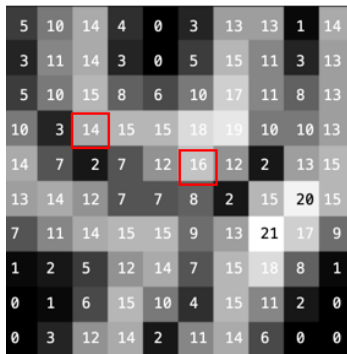
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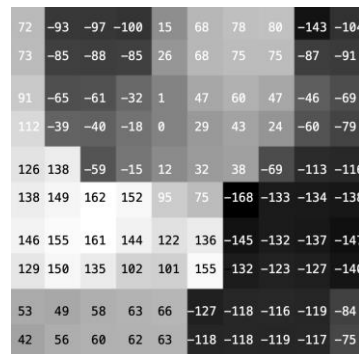
Theoretical:

Canny Edge Non-Maximum Suppression (Lecture 3)

Q1: For the following magnitude and orientation images, estimate the edge image value after non-maximum suppression for the pixels located at (3,2) and (4,5).



(a) magnitude



(b) orientation

Coding (see CS4243-Tutorial-02.ipynb):

Canny Edge Detection (Lecture 3)

- Add Gaussian noise with $\mu=0$ and $\sigma=20$ to the image `Nemo.jpeg` to produce a noisy image. After adding Gaussian noise, apply a floor and ceiling operation to ensure that all pixels remain within [0-255].
- Apply the `cv2.Sobel` with size=3 to the noisy outputs and visualize the outputs
- Smooth the noisy image with a Gaussian filter of size=15 and sigma={1, 3, 9} and compare
- Apply the `cv2.Sobel` with size=3 to the different smoothed images and compare the outputs. Are there any differences in the extracted edges?
- Apply built-in `cv2.Canny` to the image `Pole.png`, using {50, 100} as {threshold1, threshold2}. Compare these outputs when {80, 100} and {50, 300} as thresholds. Are there any differences in the extracted edges?

Past Quiz Questions:

- AY2021_Quiz2: Q1
- AY2122_Quiz1: Q5